

## 19003: Inlet valves and their potential to form “an air gap” for a Type AG air gap

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### *Introduction*

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The WRAS Approvals guidance and conditions set out below have been developed to be used when assessing products submitted for WRAS approval only.

### *Ambiguity*

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WRAS approvals considers that there is ambiguity in the ‘Regulators’ Specification for Backflow Prevention Arrangements’ and the test code sheet 2212.3 for a Type AG air gap relating to the definition and assessment of a type AG air gap. In particular, it is not clear:

- a) *if only using a vacuum test instead of measurement is acceptable, as the test code sheet 2212.3 states, “Air gaps ‘AG’ must be greater than 2D and never less than 20mm or must meet the requirements of the vacuum test”. However, the ‘Regulators’ Specification for Backflow Prevention Arrangements’ requirements also requires a minimum sized air gap for air gaps including a Type AG air gap.*
- b) *how “unobstructed” can be assessed.*
- c) *how “not more than 15° from the vertical centreline of the water stream” can be assessed*
- d) *how the air gap can be assessed as being ‘visible’*
- e) *how the ‘complete physical air break’ can be assessed*

*and what is permitted under the terms of the specification (the **Ambiguity**). For the purposes of obtaining a WRAS Approval, WRAS will want to see evidence that the assessors’ recommendations have been met (the **Suggested Approach**)*

The Suggested Approach has not been endorsed by the water companies or the courts, and they could adopt a different approach to the Ambiguity. For this reason, WRAS cannot guarantee that enforcement action will not be taken by water companies under the water fittings regulations, or that the courts will hold that your product is compliant in this regard. No reliance should be placed on the Suggested Approach for the purposes of designing or producing any product, and you should rely on your own legal advice. WRAS, accordingly, accepts no liability for loss of goodwill, business, revenue or profits, anticipated savings or wasted expenditure (whether reasonably foreseeable or not) or indirect or consequential loss arising from or in connection with the Ambiguity or the Suggested Approach.

## The Regulations

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Schedule 2 Paragraph 15 states “...every water system shall contain an adequate device or devices for preventing backflow of fluid from any appliance, fitting or process from occurring.”

## Regulators Specification for the Prevention of Backflow

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S15.2 states “Type AG – Airgap arrangement with minimum size circular overflow means a non-mechanical backflow prevention arrangement of water fittings with an air gap, together with an overflow, the size of which is determined by measure or a vacuum test”

S15.1 States “An air gap means a visible, unobstructed and complete physical air break between the lowest level of discharge and the level of potentially contaminated fluid downstream (critical water level) within a cistern, vessel, fitting or receptacle, that:

- a) is not less than 20mm or twice the internal diameter of the inlet pipe whichever is the greater; and
- b) from which water discharges at not more than 15° from the vertical centreline of the water stream.

## The Test Code Sheet Requirements

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Test code sheet 2212.3 for a Type AG states:

### **“i. Scope**

*This procedure specifies the characteristics of type AG air gaps, verified by measurement or by vacuum test.”*

### **“ii.v Internal Diameter ‘D’ of Feed Pipe (Bore)**

*Diameter ‘D’ (mm) is the maximum internal diameter found within the last metre of the supply pipe or the DN of the inlet connection”.*

### **“5.1 Air Gap Distance**

*For air gaps ‘AG’ the critical water level shall be established and the air gap distance measured from the lowest point of the water inlet to the critical water level (see informative Annex B) or by vacuum test (see Annex A).*

*Air gaps ‘AG’ must be greater than 2D and never less than 20mm or must meet the requirements of the vacuum test specified in Annex A.*

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## Intention

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WRAS approvals have assumed that the intention of the air gap requirements is to prevent backflow from occurring and that the air gap represents the column of air between the lowest level of discharge and the level of potentially contaminated fluid directly below the feed orifice. The requirements seek to ensure nothing obstructs the water within this column and that a complete physical air break is visible.

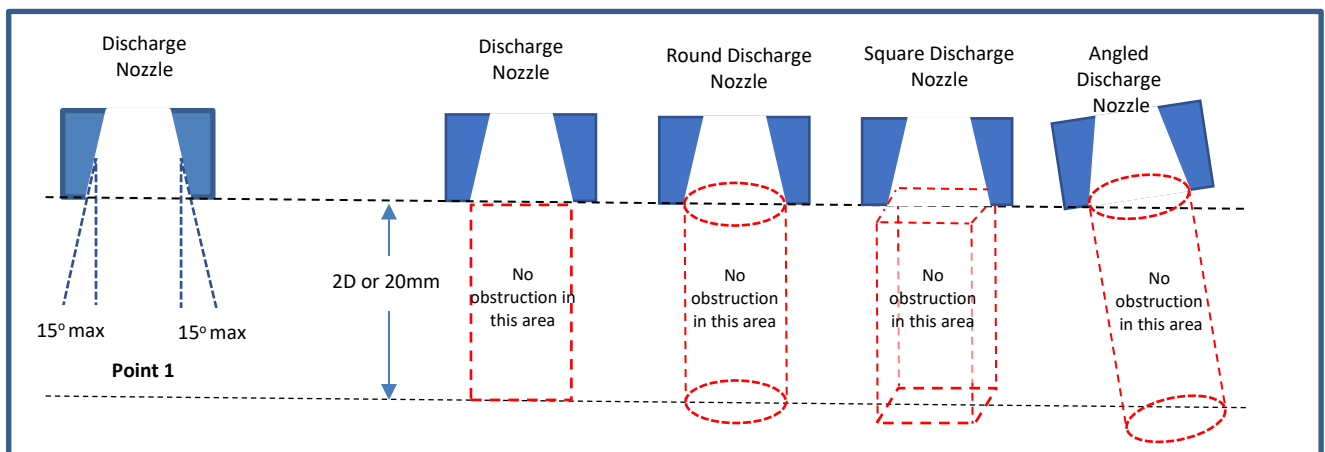
### Suggested Approach

**Scope:** WRAS approvals shall apply this WRAS Approvals guidance and conditions to the assessment of all applications for approval of inlet valves that claim to be capable of forming part of a type AG airgap arrangement.

Testing by vacuum is accepted as evidence of performance, however evidence of the dimensional requirements exists independently within the “Regulators’ specification for backflow prevention arrangements and devices” and is therefore required in addition to any vacuum test. Applicants and test laboratories may prefer to complete the dimensional test only, as this meets both requirements.

It is proposed that WRAS approvals will consider that there is potential to create a type AG air gap if:

1. The recognised laboratory, using a methodology accepted by WRAS, reports that the angle of discharge is no more than 15° from the vertical when mounted in accordance with the manufacturer’s instructions.
2. When mounted in accordance with the manufacturer’s instructions, there shall be no physical obstructions in an area that is encompassed within a virtual volume which is bounded by a cross-section of the discharge orifice extended downwards at the angle reported in point 1, to a point that is 2D or 20mm (whichever is the greater) vertically from the lowest point of discharge of the outlet nozzle. (See the diagrams below as example).



*Please Note: If the actual critical water level, when installed in a cistern, is lower than the calculated maximum permitted critical level identified in this test, there is a risk that an approved inlet valve may not meet the requirements being able to create an unobstructed air break between the lowest level of discharge and the level of potentially contaminated fluid downstream (critical water level) within a cistern.*

3. The air break is visible. WRAS approvals will consider this requirement has been met if the flow can be observed from the point of discharge throughout the distance of travel to the Maximum Permissible Critical Water Level, without the view being obstructed by any material (including transparent materials).

*Please Note: If the viewing window is restricted or reduced, there is a risk that an approved inlet valve may not meet the requirements being a visible, unobstructed and complete physical air break to the level of potentially contaminated fluid downstream (critical water level) when installed in a cistern.*

#### Inlet valves and their potential to form part of a Type AG air gap

4. There is a complete physical air break below the point of discharge. WRAS approvals will consider this requirement has been met if there if the lowest level of discharge has no connecting elements that are at the same level or below.